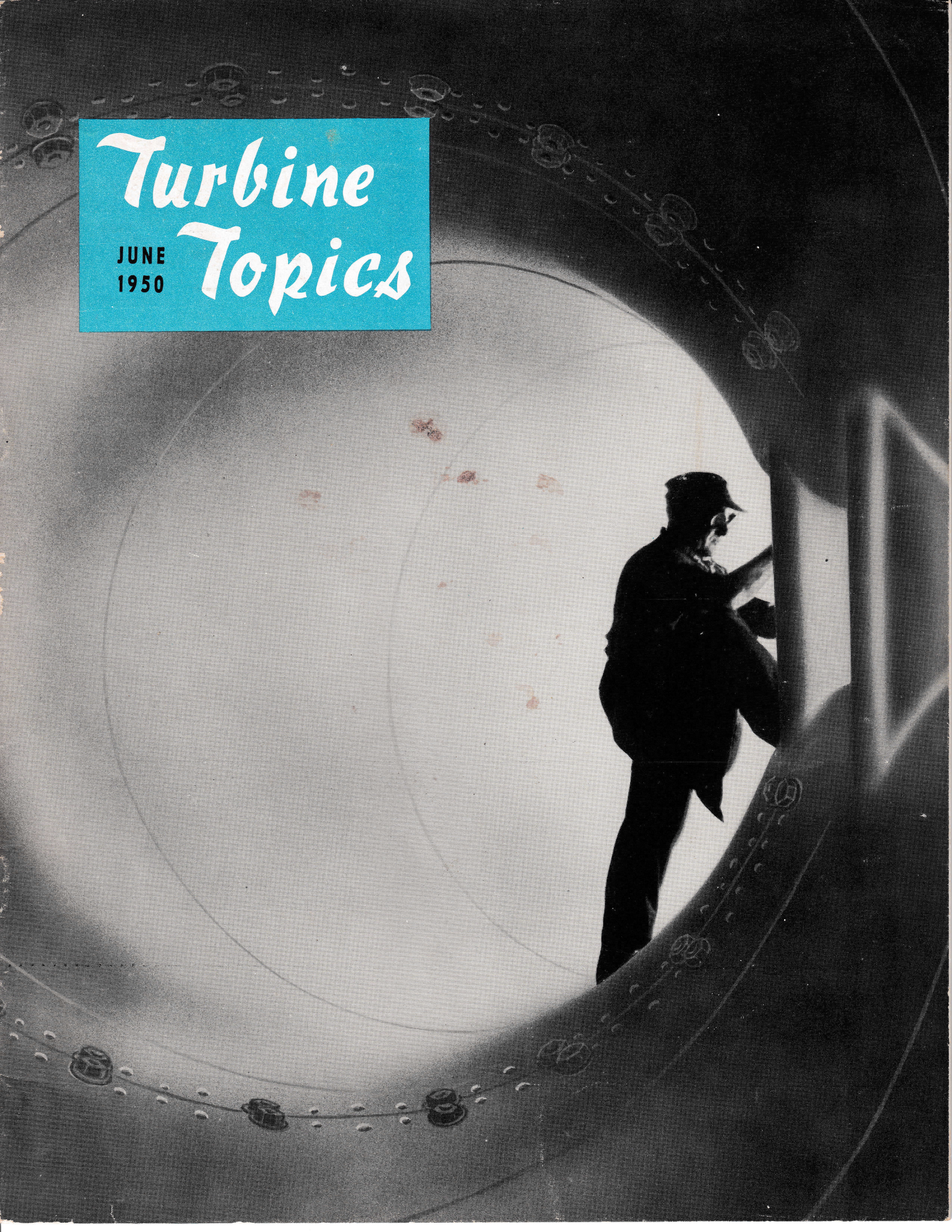
Turbine Topics

JUNE
1950



WATER—A Source of Power

By GEORGE A. JESSOP, Consultant Engineer

"Water has three principal and exceedingly important uses. First, it is an absolute necessity to sustain human and plant life. Even the food consumed by us is at least two-thirds liquid.

Second, water provides a convenient and cheap means of travel and transportation.

Third, it is widely used as a source of power. To us here at the S. Morgan Smith Company it is especially important from this standpoint.

Modern methods of power generation can be traced to origins at comparatively recent periods. The first development of water power, however, antedates history and its origin is lost in antiquity. One of the prehistoric wheels is the Chinese "Nora" (or Noria) which was usually built of bamboo and is still in use in some locations in the East for minor irrigation purposes. Sufficient power is taken from the current of a stream to raise a small quantity of water in a series of buckets or receptacles.

History tells us that water mills were introduced in Rome about seventy years B. C., on the Tiber River. Not much notice was taken of water power for many centuries although there were, without doubt, small plants in operation.

In 1581, a pump, or pumps, operated by a float wheel which absorbed power from the current, was installed at London Bridge to supply the city of London with water. In 1687, a more elaborate plant driven by water wheels was established on the Seine River in France. In connection with this plant there were a dam and chutes so that comparatively high velocity water could be supplied to undershot wheels of which there were twelve or more for each pump.

Efficiency in the early days was of little importance as the amount of power needed was not large and the full capacity of the streams was not required. Around 1840 in this country, some notice began to be taken of economy in the use of water and in 1838 Samuel B. Howd of Geneva, New York, patented an inward flow turbine.

In 1849 James B. Francis became interested in hydraulic turbine design and manufacture and first made two wheels for the Boott Cotton Mills. He approached the design from a scientific standpoint and attempted to make accurate tests of the power and efficiency. So systematic and sound was his approach to the problems involved and so successful were his efforts that the name Francis is still used, on this continent and in Europe, to designate all turbines except the impulse and axial flow.

One of the most difficult details of successful testing was, and is today, the exact measurement of water quantity. A great many different methods were used, one of the earliest being floats. It was soon learned that the velocity in the center and on the surface of a stream was greater than at the bottom and points close to the shores. By using floats of such lengths that the lower end would be near the river bottom and then taking an average of a large number spaced across the stream and carefully noting the time required to travel a fixed distance, approximate quantities could be determined. Normally, there was too much variation in the bottom and sides of streams to get accurate results.

In the Western part of this country, the Miner's Inch was much used for small quantities for impulse turbines. A dam was placed across the stream and part of the obstruction consisted of boards with a rectangular opening which could be readily adjusted to take the entire flow of the stream with a head of water usually six inches, above the centerline of the opening. The openings were sometimes two inches high and sometimes four inches. The different States had different definitions for the quantity of water discharged. For example, with six inches head, the Colorado Law defined 38.4 Miner's Inches as equivalent to one cubic foot of water per second.

California and several other States specified 40 Miner's Inches and Idaho and some other Western States 50 Miner's Inches as equal to one cubic foot of water per second, or CFS. The actual discharge per Miner's Inch, however, varied substantially with the number required to discharge the total quantity of water. The Pelton Water Wheel Company published a table as early as 1900 which shows that the quantity of water discharged per Miner's Inch can vary as much as ten per cent above or below the lawful value depending upon the size of the opening and the exact head taken into account.

Accurate water measurements can be made with a properly designed orifice exactly dimensioned and with means for determining the head of water to its centerline. The Miner's Inch system was a simple method of using an orifice. The simplification, however, resulted in undesirable inaccuracies.

Starting about 1880, James B. Francis, the turbine designer, made scientific and accurate investigations in connection with the use of a sharp crested rectangular weir. Since 1849 he had continued his work on turbine design and he realized the necessity of having accurate water measurements so that exact efficiencies could be determined. The results of his experiments were tabulated and written up in reports in a manner which compares favorably with the best that is done today.

The total volume of water flowing through the McNary installation turbines will equal that going over the American and Canadian Falls combined.

In fact, his written works are among the outstanding examples of scientific reporting.

For accurate measurements, the weir must have a smooth channel of approach with substantial depth below the weir crest so that the velocity of approach is small. The sides of the channel can be even with the sides of the notch or the notch can be narrower than the approach channel. The formulae for discharge are, of course, different for the two types of weir. For many years the dimensions of the weir and the method of making the measurement of head as set forth by Francis were used exclusively and the device was known as the Francis weir. Later, careful investigations showed that minor corrections to the Francis rules were needed for exact results.

A few years later, about 1887, the Venturi Meter was introduced by Clemens Herschel. This is a tube which is contracted to about one-third of its entrance diameter and then very slowly expanded. This tube should be placed with its centerline exactly horizontal. Then the difference between pressure or head of water measured at the large entrance section and at the throat determines accurately the velocity and, therefore, the quantity of water flowing through the meter.

Another early method of measuring water was by means of the Current Meter. This meter is simply a small propeller with screw type or curved vanes or blades which when held in moving water revolves at a rate proportional to the velocity. The first current meters were somewhat crude but have since been greatly improved.

Pitot Tubes were used for a number of years but have been largely discarded in hydraulic turbine testing. They are still frequently utilized in connection with water works systems. A Pitot tube has a small opening which is pointed upstream and measures the pressure plus the velocity head. It also has an opening at right angles to the stream which measures only the pressure head. The difference between the two pressures permits an accurate determination of the velocity at any given point of a stream of water. The Pitot tube is normally used only in closed water passages. Sometimes a double Pitot tube, or Pitometer, having one opening pointed upstream and one downstream, is employed thus obtaining double pressure difference or deflection. The pressure difference is measured by means of a U-tube.

Measurements made by the Current Meter and the Pitot Tube are open to question because of the possibility of irregular or changing flow during the taking of the measurements. To overcome this, multiple current meters have been used and in some cases, multiple Pitot tubes. It is impracticable, however, to properly cover the entire section where the measurements are being taken. There is also substantial uncertainty as to the velocity close to the boundaries of the water passage, these velocities being comparatively low. Painstaking calibration of all current meters and Pitot tubes must be made prior to their use.

An interesting method of measuring water quantity and one which at first thought appears to be accurate, is by means of a traveling screen. Such a screen can be fitted fairly closely to a rectangular water passage with its top surface open and can be supported on antifriction bearings so that the screen, after introduction, very quickly assumes the velocity of the water. From superficial consideration, the screen would seem to travel slightly slower than the water since it is necessary to overcome the small amount of friction involved. Actually, however, the water quantities determined by the velocity of the screen and the area of the passage are too large because the screen travels faster than the slow moving boundary water at the clearances between the edges of the screen and the water passage and thus leakage is upstream and not downstream.

The average size and capacity of turbines have very greatly increased with the passing of the years. For example, prior to 1930, the average capacity of unit manufactured by our Company was 770 horsepower. From 1930 to date this figure is 7,900 horsepower and from 1946 to date, the average becomes 16,100 horsepower. With this increase in horsepower, of course, the quantities of water have also become much larger. It is much more difficult to accurately measure large quantities than small. Consequently, new methods have been tried.

One of these was very interesting although it has been discarded. This was called the Salt Titration Method. You can readily perceive that the quantity of water contained in a vessel of any size can be determined if a known quantity of salt is introduced and thoroughly stirred up and then the amount of salt in a given quantity, say one gallon, or one cubic foot of the solution accurately measured. This quantity can most readily and cheaply be determined by the "Titration Method" which consists in introducing a chemical which will combine with the salt and change the solution into a substance which has color. The amount of the chemical required to complete the reaction determines the quantity of salt, or the salt concentration. For comprehensive tests of large turbines too much salt was required and too many samples were needed. This method, in most cases, was sufficiently accurate but proved to be too expensive.

An excellent procedure frequently used was developed by Professor C. M. Allen, a well-known test engineer, and is known as the Allen Salt Velocity Method. This method consists in introducing a quantity of salt upstream and carefully measuring the length of time required for the "dose" to arrive at a given point downstream. The passage of the salt at the up and downstream points is determined by measuring the electrical conductivity of the water. Salt increases the conductivity very substantially. This method is accurate but requires a reasonable length of water passage so that the time interval is sufficient to hold errors to small percentages. The deflection of the electrical instruments is recorded on moving charts in the form of areas, small at the upstream and large at the downstream end of the measuring section. The time between the centers of area determines the velocity of the water. The area of the water passage must be carefully measured.

The method most frequently used now is known as the Gibson, or Pressure Rise, Method. This system of measurement can only be employed in a closed conduit and makes use of the well-known fact that as the velocity in a pipe, or passage, is decreased, the pressure rises. We are all familiar with the "water hammer," or pressure rise, which takes place when a spigot, or tap,

is rapidly closed. When using this method, the wicket gates of the hydraulic turbine (or the needle of an impulse wheel) are fixed at a series of openings. The power and head is carefully determined over a period of time long enough to obtain exact figures. The gates are then closed by the governor and the increase in pressure between a point near the turbine and one a suitable distance upstream from this point is measured by special equipment. This rise in pressure determines the velocity which existed at the fixed point of gate opening which has been reduced to zero by the closing of the gates.

All of these methods require great care in execution for accurate determinations. It is expected now that tests shall be accurate within a very few tenths of one per cent. If any such tolerance is to be obtained, the various test procedures must be properly and carefully followed.

The methods of testing now accepted as being of sufficient accuracy are set forth in a Power Test Code gotten up and approved by the American Society of Mechanical Engineers. The first code approved by this Society was published in 1915. This was rewritten in 1926, rewritten again in 1938 and revised in 1945. The first ASME code was not too satisfactory and in 1917 the Machinery Builders Society, of which our Company was a member, published a code. This was used almost exclusively until 1926 but was then gradually replaced so that after 1930, the ASME codes were practically universally accepted.

It is very difficult to visualize the large quantities of water used by the modern turbine, particularly by the large adjustable blade propeller, or Kaplan turbine. The supply of water for New York City has been much in evidence in the newspapers for the last year or more. The average daily consumption prior to the shortage was given as one billion gallons per day. To me, and I believe to most people, this is a meaningless figure. In the first place, we have little or no conception of a billion. In our work we speak of quantities in cubic feet per second (CFS). A rough calculation of CFS required for a given horsepower under a given head can be determined by multiplying the horsepower by eleven and dividing by the head in feet. This formula is still in general use where the head is taken as the difference in elevation between head and tail water and where the output is considered as that coming from the generator converted from kilowatts to horsepower by multiplying the kilowatts by 1.34.

The main, or general, drawing for the turbines going through our shop usually notes the head and the guaranteed horsepower in the title box. From these figures, a more accurate determination of the quantity of water will be obtained by using a multiplier of ten and one-third rather than eleven. The head given on our drawing is net effective head at the turbine and the horsepower is the output of the turbine delivered to the generator. With modern turbines the efficiency at full load will average about 85 per cent. The multiplier of ten and one-third corresponds to this efficiency whereas the multiplier eleven corresponds to 80 percent efficiency. Maximum efficiency at part load averages about 92 per cent and the multiplier at this point becomes 9.5.

The quantity of water used by New York City is more readily comprehended by us if we reduce it to CFS. We find this figure to be 1,550. In the city of York, we use about 13,400,000 gallons per day, or 20.7 CFS. It is astonishing to note how small these quantities are compared with that going through a large Kaplan unit. For example, at McNary, the maximum discharge when the blades are opened wide under the lower range of head is 16,000 CFS or more than ten times the quantity used by New York City. The Bonneville Turbines have only slightly less capacity, the maximum being 14,300 CFS.

Many of you have seen Niagara Falls. The average quantity of water flowing over the American Falls at Niagara is 15,500 second feet. When looking at the Falls (see the picture on the cover), it is quite impossible to imagine all of this water on the 1,000 feet long spillway going through one turbine.

Eventually, at McNary it is expected that fourteen units will be installed, eight now being on order. Through these units a flow equal to that going over the American and Canadian Falls together will pass through the turbines. The maximum discharge of two McNary Units is sufficient to supply the population of the entire United States with water for domestic and general purposes.

The quantities of water delivered by pumps of our manufacture are also exceedingly large. The adjustable-blade pump recently shipped to Brazil for the Traicao Development has a maximum capacity of 1,700 CFS, 13 per cent more than the quantity used by New York City.

Each of the six fixed-blade propeller pumps delivered to Cincinnati several years ago will deliver 1,500 CFS. The centrifugal pump sent to Brazil for the Pedreira Development will also discharge 1,500 CFS.

When making efficiency tests where such large quantities of water are to be measured, great care must be used. We find that the Testing Code at the conclusion of the description of each method of test now considered acceptable has this statement, "This method

(Continued on Page 6)

YOUTHS VIEW PLANT

Pictured above is the assembled William Penn High Industrial Student group ready to be taken on a guided tour through the company's plant facilities.

Students from North York, West York, and Mt. Rose High conducted through the shop by members of the company during the past Boy's Week.

COVER PICTURE

Salto Grande Project turbine to be located on the Santo Antonio River in the Brazilian State of Minas Gerais. The unit is to deliver 35,100 horsepower when under 319 ft. net head, at a speed of 257 rpm. The runners are solid stainless steel app. 16,000 lbs. each (2 units). This particular installation will be the first of three "large" projects to be erected in Brazil.

WATER—A Source of Power
(Continued)

shall be applied only by trained and experienced men."

In our Laboratory, the two methods now employed are the weir and the Venturi tube. The approximate maximum quantity flowing over the weir is equal to the average used by the city of York, 20.7 CFS. In general, the quantity is substantially less. Great care must be used to keep the weir in the best condition, to measure the head of water flowing over the crest accurately and to so baffle the water approaching the weir that the velocity in the approach passage is evenly distributed. For example, we find it necessary to clean the baffling screens at least once a day even though the water is clear and free of foreign matter.

Our Venturi tubes are very carefully calibrated, measuring the quantity of water by means of a weighing tank where the weight and, therefore, the quantity of water can be exactly determined. There is always a coefficient of slightly less than one to be applied to the flow through a Venturi meter.

In 1914, thirty-six years ago, the units at the Tallulah Falls Plant of the Georgia Power Company were tested and in order to get an exact determination of the quantity, three methods of measurement were used, the weir, the Pitot tube and the Venturi meter. The weir and the Pitot tube measurements were supervised by experts and the coefficient of the Venturi meter was determined by the manufacturer from numerous experiments. The results obtained by the three methods were in close agreement.

S. MORGAN SMITH—1891

S. Morgan Smith, Manufacturer of The Success Water Wheel, Shafting, Pulleys, Cog Gearing, Steam Boilers and Machinery

Recently, Howard Myers, Machinist on Floor 3 and 4, showed your Editors a copy of the Trade Edition of the York Daily Newspaper dated April 1891. Inside we found an interesting story about S. Morgan Smith and the Company which bears his name. We want all of you to share this article with us, hence the following reprint in which you will note the international recognition enjoyed by our products 60 years or more ago.

There is not perhaps in the line of industrial activity in the United States today, any department of progress in which native genius and enterprise have produced such remarkable and useful results as in the construction of mill machinery. What with invention, improvement and discovery, the advance made in this field has been nothing less than marvelous and furnishes interesting reflections as to possibilities in the future. In this connection prominent mention should be made of a noteworthy enterprise in this city, namely the manufacturing establishment of S. Morgan Smith.

In 1876 Mr. Smith began to manufacture his Success water wheel, and the success with which it met and its acknowledged superiority over others soon compelled him to keep two of the large shops in this city constantly engaged upon his work of building water wheels, shafting, pulleys and cog gearing, etc., etc. But with the growing popularity of the Success water wheel, and the other machinery made by Mr. Smith, the demand became so great that he was unable to supply it. To meet this demand Mr. Smith decided to erect a plant and manufacture water wheels, gearing, boilers, etc., and in the spring of 1890 began the building of his present large shops, located in West York on the line of the P. R. R.

The premises cover an entire block of ground upon which are erected a large brick building, comprising a machine shop 40 x 300 feet, a boiler shop 60 x 100 feet and a pattern shop 50 x 75 feet, which are fitted up and equipped with the latest and most improved machinery, and are the only shops in Eastern Pennsylvania, outside of Philadelphia, prepared to manufacture cut gearing—these works being supplied with machinery which will cut gearing from 2 inches to 10 feet in diameter.

These works are also supplied with a pulley mill that will turn off and bore out 20 pulleys, 24 inches in diameter, in one hour. It is the only machine of this make in Pennsylvania, and the only one of six in the United States of America. These works employ a large number of skilled mechanics, and are running to their fullest capacity. Mr. Smith is so cramped for room that he is going to put up another building 40 x 40 feet. Mr. William Miller, of Freystown, is making the plans for this building, and will do the carpenter work upon it.

The goods manufactured embrace The Improved Success Water Wheel, all kinds of gearing for paper, pulp, cotton, flour and saw mills, boilers and all kinds of wrought iron work. Some of the iron tanks now being made are 40 x 21 feet. Mr. Smith has long been recognized as one of the largest manufacturers of Turbine water wheels and mill machinery in the United States. Mr. Smith, who has 8 patents upon the Turbine water wheels, has the honor of being the patentee of the water wheel from which were received the best results in the last inter-State and *international competitive tests* of water wheels made in this country.

One of the largest improved Success wheels now in operation in Canada under a head of 92 feet develops over 2000 horse power, which is said to be the largest wheel on the Western Continent working under a head so high. This wheel is in a place where five other makes of wheels had been placed and were crushed or broken by the pressure of the water.

Since the Success water wheels have been placed upon the market they have been sold in all parts of this and foreign countries, and today one of the largest is supplying the motive power for a large paper mill in Moscow, Russia, and two others have been sold to parties in that far off cold country.

Mr. Smith, in connection with manufacturing the large line of goods mentioned above, is a dealer in a full line of flour and saw mill supplies, such as smut machines, bolting cloths and circular saws. He is also extensively engaged in the manufacture of flour, he and his sons owning a 100 barrel New Roller Process mill at East Berlin, and a two-thirds interest in another of the same kind at Bigmount, York Co., Pa.

Mr. Smith is an old resident of York and has long been identified with our manufacturing interests, of which he possesses a thorough knowledge, while his integrity and enterprise have won for him the esteem of all classes, and placed him in the front rank of our manufacturers, in which he is ably assisted by his sons.

Bowling

Chaplain C. Elmer Lease drawing the lucky winners of the door prizes.

Millard Deardorff, who had High Single Score of the year, 269, receives his award from Beauchamp E. Smith, President, who presented all of the awards.

Bowling League Offic season are from left Joe Lewis, Vice Presi kee, Treasurer. Back brough, Secretary and dent. Gordon Wecker, absent when photo wa

In the 110-120 class, Fred Boyd received an achievement award for his gain of 3.73 over last season's average.

Luther Wilt, Foreman of the Weld Shop, received achievement award for his gain over last season's average.

The toastmaster of th quet of the S. M. S. at Moser's Restaurant Duncan D. McArthur Company, shown he audience.

The winners of the O'Shaughnessy playoff held at the close of the season was the team from Dept. C. For their achievement each member received an individual trophy. They are, from left to right, front row: Martin Weaver, James Decker, captain, and Carl Beck. Back row: Gordon Seitz, Walter Sheffer and Harry Fitzkee.

Having charge of the leftover department after the banquet was Kenneth Frey shown here clearing the table of edibles.

Past President, Robert plating the next item ing the business perio

Banquet

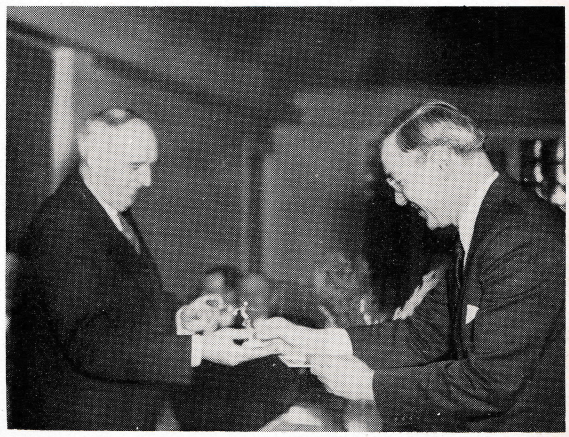
cers for the 1950-51
to right, front row:
ident and Harry Fitz-
row: Kenneth Shana-
d Henry Seitz, Presi-
, Asst. Secretary, was
es taken.

Robert Luzier receives the trophy for High Triple of the year. His total was 564.

Harry Fitzkee, Treasurer, presenting his new system of paying bowling dues.

he 14th Annual Ban-
Bowling League held
r on April 1st was
r, secretary of the
ere addressing the

Carl Beck receiving his second trophy for the evening for his gain over last year's average.



Tom Norbom, winner of a special award for his "High" score during the season. Other winner of such an award was Charles Epley.

t Rudacille, contem-
o be discussed dur-
d.

The seasonal winner and recipient of the President's Cup was Dept. B team shown in the photo on the left. They are from left to right, sitting: Gerald Kahley, Millard Deardorff, Captain, and George McGuigan. Standing: Milton Strausbaugh, Fred Boyd, Gordon Drescher and Kenneth Frey.

Millard Deardorff, Captain of the team from Dept. B, receives the President's trophy from B. E. Smith, designating them as seasonal winners. Looking on is Gerald Kahley and Gordon Drescher.

Turbine Topics

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JUNE, 1950 — 9 — VOLUME 7, No. 3

HOW TO PROMOTE ADULT DELINQUENCY

If anyone believes that the so-called "welfare state" is not guilty of contributing to adult delinquency, and if adult delinquency is not just as destructive to society as juvenile delinquency, we are eager to hear evidence to the contrary.

To support our case, we want to tell you about what is happening in Norway, the most recent nation to be placed under a "welfare state" government.

From Norway's leading weekly Farmand Norsk Forretningsblad comes the dreary story of Norway's progress down the road marked "Something for Nothing."

Considering the centuries of self-respect, thrift, and an honest day's work that lie behind the sturdy Norwegian people, it is shocking to see how quickly this nation is changing.

The demoralizing "confession" drugs of the Communist secret police have nothing on the drug of socialism, incorrectly called the "welfare state."

Here are a few quotes from Farmand regarding the changes in the attitude of the Norwegian people.

> **"Only children believe that Christmas gifts are provided by Santa Claus. The Norwegians, however, have come to believe that they can get something for nothing."**
>
> **"Socialist propaganda has also given a kind of moral basis for theft. Some time ago an embezzler offered as an excuse that he was earning too little in comparison with his boss. There is no reason to consider this an isolated case."**
>
> **"The slogan 'soak the rich' has created the illusion that there always remains something to take."**

Here we see the secret weapon of the "welfare staters"—untruthful arithmetic.

When the honeymoon is over and the rich have been stripped, the truth bares its ugly head, and if the people have not lost their power of self-government, they can change governments and start rebuilding.

That is what has happened in New Zealand and Australia and almost happened in England.

But the rebuilding is a long, hard process because the people have usually changed their work habits.

Farmand tells us what is happening to work habits in Norway:

> **"The Labour Government must bear the burden of responsibility for the fact that absenteeism and low working efficiency are widely tolerated. This is a further indication that the morale of the Norwegian people is slowly being undermined."**

Why should this be?

Most important, perhaps, is the basic fairy-tale that they can get more without producing more, but there is at least one other important factor, which Farmand explains as follows:

> **"The difference between wages to skilled and unskilled labour has been narrowed, which leaves little incentive to become a skilled worker."**

What Farmand might have added is that it also leaves little incentive to stay a skilled, productive worker.

The next item is exactly what you would expect it to be: the Norwegian people are no longer interested in saving.

There are two reasons for this (as there always are in the "welfare state").

First, the state is going to take care of them in their old age by "soaking the rich."

Second, the "funny money" policy of this (and every other) "welfare state" makes saving a silly idea because there is no way of knowing whether the money will be worth anything after it is saved.

The next item of the "welfare state" is harder to present as evidence, but it is one that must be understood.

As Farmand states it:

> **"It has also impaired the incentive of those who mean most to the economic success and growth of the nation, viz., the entrepreneurs, the risk-takers, the promoters, and the job makers."**

This is just what the "welfare staters" want to happen because when the business falls, the state can take it over.

Farmand says:

> **"We have learned with sincere regret that many people in the high income brackets are now contemplating emigration after having seen what the Government proposes in the way of new confiscatory taxes."**

In making this statement it is quite possible that Farmand has overlooked something: maybe the Labour Government will not allow these people to take themselves and their property elsewhere.

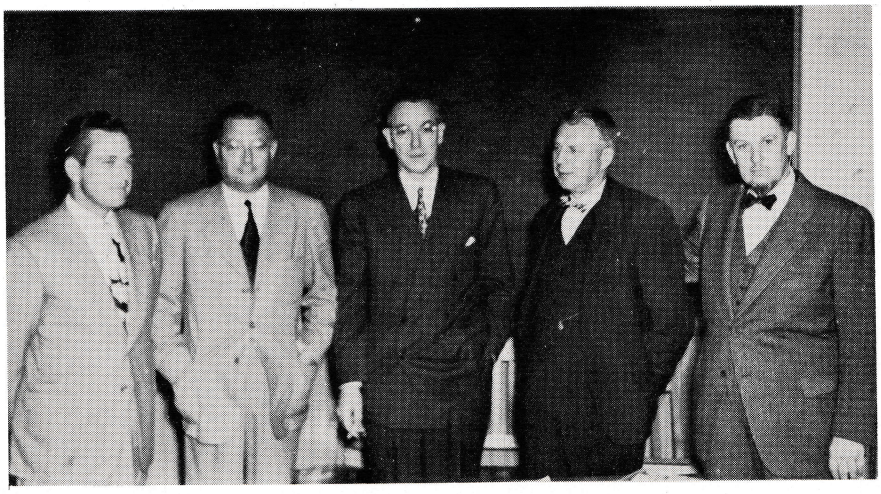
In the meantime, as you can well imagine, the Norwegians are not, economically, making any substantial progress in the only thing that counts, progress in the quantity and quality of the things they produce.

As Farmand puts it:

> **"To sum up, there can be no doubt that it represents a moral relapse when people imagine that it is insignificant whether one is absent from work or sticks to the job, and whether one saves or squanders one's money."**

Adult delinquency is the Socialist's road to political power.

Annual COMPANY FINANCIAL REPORT MEETING



In the photo at the top are D. D. McArthur, Henry Duque of Los Angeles, Calif., B. E. Smith, Charles Lansing of Chagrin Fall, Ohio, and B. B. Smith, all members of the Board of Directors of the S. Morgan Smith Company who attended the meeting. On the left is a view of some of the Foremen and Supervisors studying the Annual Report and preparing to ask questions concerning it.

Prior to distributing the Annual Financial Report of the Company for 1949 (which appeared in the April 1950 issue of Turbine Topics), to all of the employees, B. E. Smith, President, assisted by B. B. Smith, Vice President and Duncan D. McArthur, Secretary, presented the results of 1949 operations to all of the Foremen and Supervisors in the plant and offices.

Insurance Claims Paid

FROM APRIL 1, 1950 TO JUNE 1, 1950

Name	Amount
Donald Andrews	$ 184.00
Douglas Baker	110.00
Nesta Becker	5.71
Martha Bender	21.43
Paul Billet	113.85
Harry Boyer	46.75
John Brillhart	454.71
Arthur Comtois	5.50
Richard Crouse	25.00
Kenneth Crumling	60.50
P. J. Delhamer	5.00
George Denues	47.71
C. William Einsig	58.10
John Ellis	30.71
Thomas Faircloth	140.00
Harry Fitzkee	51.50
William Frey	37.00
Reuben Gunnet	70.00
Frances E. Hamilton	3,000.00
Harry Hinkle	10.00
Walter Hockensmith	90.00
John Hodovance	5.00
Anthony Hoffman	42.00
Vernon Hoke	56.50
Walter Hollingshead	115.00
Elmer Houch	30.00
G. Earl Jennings	33.99
G. Dugan Johnson	45.00
Gerald Kahley	40.60
Leonard Klinefelter	26.00
George Klunk	72.86
Otto Koerner	52.25
Curtis Lau	42.00
Joseph Lewis	92.00
Robert D. Mann	110.00
Rebecca McCracken	60.00
Earl Meisenhelter	11.43
Ervin Miller	174.71
A. J. Mummert	20.29
George Petry	150.00
Smyser Reiker	44.86
Chester Reisinger	70.00
James G. Rowe	60.00
Howard Sechrist	20.00
Guy Shunk	66.00
Paul Smith, Jr.	50.00
Ernest Stokes	15.00
Kurvin Strayer	97.05
Stewart Strine	156.00
James E. Tarbert	48.00
Charles Weaver	10.00
Martin Weaver	58.50
Lloyd D. Wilt	10.00
Total	$6,452.51
Total amount paid in claims from July 1, 1949 to May 31, 1950	$57,106.67

UP and DOWN the AISLE

On Saturday, May 6th at 7 p. m., Gordon B. Wecker, son of Mrs. Lula B. Wecker, 732 Prospect Street, and Doris R. Spring, 120 East Market Street, York, daughter of Mrs. Dorothy Crawley, Marion, New York, were united in marriage at the Trinity E. U. B. Church of York. The Pastor, Rev. J. H. Fleckenstine, performed the single ring ceremony in the presence of the immediate family and friends.

Since their return from a wedding trip through the Pocono Mountains they are residing at 1200 West Princess Street. Gordie is employed by S. M. S. in the Shop Office.

Miss Lois E. Kuntz, daughter of Mr. and Mrs. Arthur Kuntz, 1039 East Hay Street, and Kenneth A. Kindig, York R. D. No. 5, son of Mr. and Mrs. Albert Kindig, were united in marriage on Sunday, April 30th in the Fourth E. U. B. Church of York. Rev. Edward W. Leech, Pastor, performed the double ring ceremony by candlelight in a setting of white flowers and palms.

Miss Norma Kuntz, sister of the bride, was the maid of honor and Miss Patricia Leppo, niece of the bride, was junior bridesmaid. George Rutledge served as best man and Donald Wolfgang and Preston Innerst were ushers.

Following the ceremony a reception was held at the Pine Tree Inn for approximately 125 guests. Since their return from a wedding tour through the South, they are residing at 1296 West Poplar Street.

Lois, a graduate of the class of 1943 at the William Penn Senior High School, is employed in the Cost Department of S. M. S. as a typist. Kenny, a former employee in the Weld Shop office, is now employed by the Metropolitan Edison Company in York.

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Miss Phyllis Jean Delhamer, niece of Mrs. Harry Altland, 247 West Philadelphia Street, became the bride of C. Holmes Royer, son of Mr. and Mrs. Chester H. Royer, 304 Carlisle Ave. at 3 o'clock the afternoon of June 10th in the First Church of the Brethren.

The bride was given in marriage by her uncle, Harry Altland. Miss Jeannie Peters was the maid of honor. Lowell Royer, brother of the bridegroom, was the best man. The ushers were Robert W. Delhamer, brother of the bride, and Raymond Gundel, brother-in-law of the bridegroom.

A reception was held in the social hall of the church, after which the couple left on a wedding trip to New York City. They will reside in Huntingdon where the bridegroom is attending college.

While driving home from work on Friday evening, May 12th, Charley L. Hamilton of Stewartstown, R. D. No. 3, was fatally stricken with a heart attack along the Susquehanna Trail near the Hametown Church. He was 61 years old.

Charley, who was an employee of S. Morgan Smith Company for the past six years, was employed in the Shipping Department as a

On May 1st, three more employees were placed on pension by the S. Morgan Smith Company. They are shown in the photo on the left with Duncan D. McArthur, Secretary, who presented them with their first checks. They are: Walter Wagner, a maintenance machinist, with 22 years of service; Guy Ludwig, a field erector, with 29 years of service; and George Litsinger, Service Engineer, with 41 years of service.

Boxer, Packer and Loader. He had returned to work the earlier part of the week following an absence of three and one-half months following an operation.

He is survived by his wife, Frances Thompson Hamilton, a nephew, a half-sister and a half-brother.

Funeral services were conducted from the Webb Funeral Home in Stewartstown with Rev. Carroll Doggett, Pastor of the Calvary Methodist Church, officiating. Interment was in the Stewartstown Cemetery.

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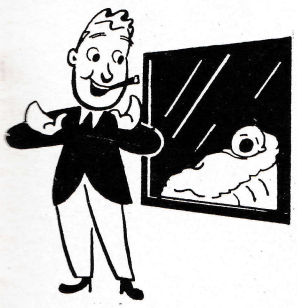


During the past two months the stork paid visits to the following homes in the S. Morgan Smith Company. They are:

Mr. and Mrs. Robert Mann, whose second child, a son, was born at the West Side Osteopathic Hospital on April 14th. James Richard weighed eight pounds, twelve ounces at birth. Bob is employed as a watchman.

Mr. and Mrs. Douglas Baker, to whom a son was born on April 15th at the York Hospital. Randall Douglas, the Bakers' second son, weighed seven pounds, two and one-half ounces at birth. Doug is employed as an engineer in the Design Department.

Mr. and Mrs. Russell Rinehart, who first child, a daughter, was born on May 27th at the York Hospital. Marcia Louise weighed seven pounds, two ounces at birth. Russ is employed in Department C as a Machinist.

Congratulations and Best Wishes.

S. Morgan Smith Athletic Association

Announces the

HIGHWAY THEATRE PARTY

Thursday Night, 6:30 P. M., July 27th, 1950

Feature Attraction

"THE BIG HANGOVER"

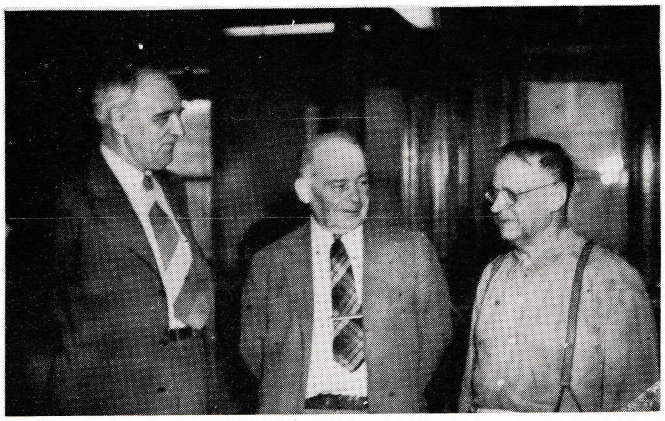
A Comedy (in color)

Starring VAN JOHNSON—ELIZABETH TAYLOR

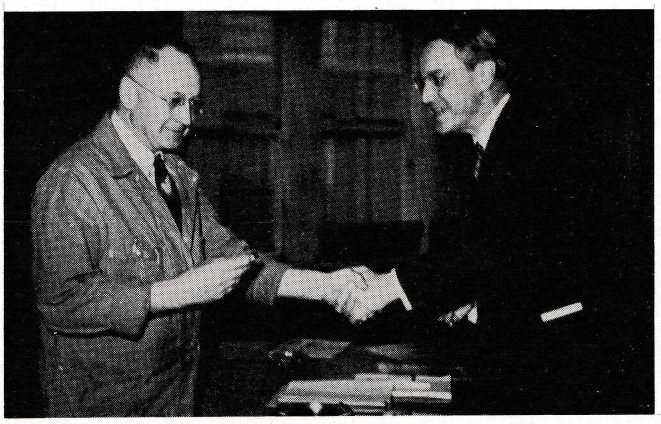
Members admitted free upon presentation of dues cards at theatre door. Members' children or guests (unlimited number).

Adult's Ticket . . . 25c **Children's Ticket . . . 07c**

(Guests or children's tickets cannot be bought at theatre. May be bought only from the committee in the shop or plant.)



George Jessop, center, President of the 25 Year Club, telling Tom Norbom and William Boyer, both of whom retired on June 1st, that they are still members of the Quarter Century Club and that he will be looking for them on the night of the Annual Banquet. Tom has worked for 27 years as a Design Engineer in the Design Dept. while Bill has completed 38 years continuous service as a Machinist in Dept. A.



Prior to presenting the Annual Financial Report to the foremen and supervisors, B. E. Smith, President, presented Albert Sheaffer, Foreman of the Tool Room, with a service pin in recognition of his 40 years of continuous service.

Money Is Necessary Because Barter Is No Longer A Practical Means Of Exchange

Does Money Mean Prosperity?

We call the day by day method by which we earn a living our economic system. It is a simple system in the way it operates. But it has been made to seem complicated by a lot of big words.

Man works, using his natural resources and tools, to help produce the necessities of life. The farmer produces food. The carpenter produces housing. We in our business are producing hydraulic turbines and accessory equipment.

Each worker receives money for his work—money which he spends for whatever he wants. Or, he may save some of it to invest in the hope of making his later life more prosperous.

What could be simpler? It was simple when each worker traded the product of his labor directly for something produced by someone else. But the use of money to help us trade our labor for the things we need has caused some confusion.

All of this is explained simply and clearly in a book, "Money," written by Fred G. Clark and Richard Stanton Rimanoczy. We have selected ten articles from this book for presentation in Turbine Topics and the first article appears on this page. Permission to reprint this series has been granted by the American Economic Foundation.

The ten articles offer a basic course in economics and an understanding of the free enterprise system which has made the United States the most prosperous nation on earth.

Why We Need Money?

If each man lived his economic life alone, there would be no need for money, because he would not have to exchange anything with anybody: he would produce everything that he used or consumed.

But today man exchanges most of the things he produces with other men who produce other things which he needs.

If this exchange could be **direct** (that is, if a farmer could exchange a sack of potatoes for a train ride) there would be no need for money.

But direct exchange is impractical and there must, therefore, be a means of **indirect** exchange, a means by which goods and services can change hands without actual barter.

In order that this indirect exchange may take place, each man receives so much money (so many numbers labelled dollars) which serve as a receipt for his contribution to the production.

These numbers are stamped on pieces of paper and metal or written on checks, and pass from hand to hand in exchange for goods and services.

It must be constantly remembered that the numbers are not the goods and services.

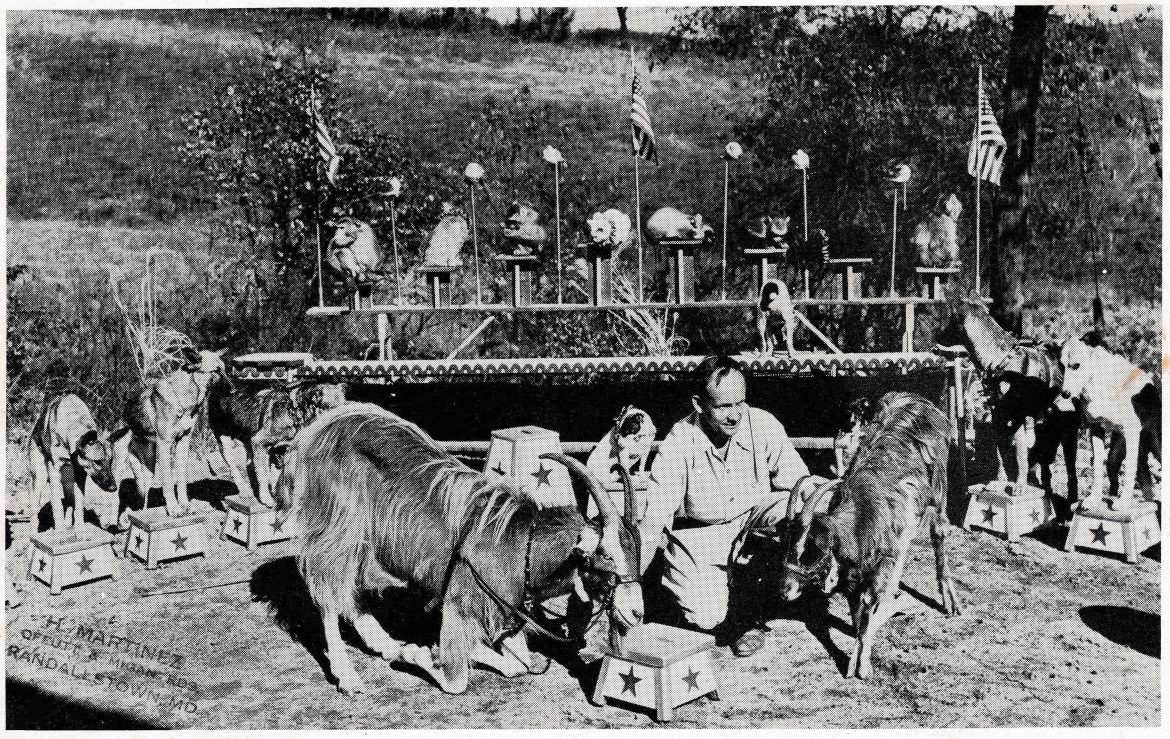
ANNUAL PICNIC

NEW DEAL LODGE NO. 1400—I. A. of M.

JULY 29, 1950—WILLOW MILLS PARK

Mechanicsburg, Pennsylvania • R. D. No. 1

For Members and their Families



The Martinez Society Animal Circus, under the trainng of Captain Herbert Martinez, of Randallstown, Maryland, will give two performances at the annual picnic of the New Deal Lodge No. 1400.

Program of Events

Busses leave the Corner of Park and Manchester Sts. at 9:30 a. m. Please contact the entertainment committee if you desire transportation.

9:00 a. m.—Busses Leave Park and Manchester Streets
11:30 a. m.—Dinner
12:30 p. m.—Games for Children and Adults
3:00 p. m.—Animal Circus Show
4:00 p. m.—Rest Period
5:00 p. m.—Draw Prizes
5:30 p. m.—Supper
7:00 p. m.—Animal Circus Show

For the Entire Family

Fishing **Swimming** **Roller Skating** **Speedboats**

Free Refreshments **Ice Cream** **Milk** **Soda**

Bring your basket lunch and use the facilities of the Park, which include outdoor ovens where your meal might be prepared.

Join with your fellow workers in one great day of fun at this lovely spot.